“Ni－Zn铁氧体颗粒－光刻胶”覆盖的片上射频电感

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摘　要：

报道了采用新型“纳米颗粒－光刻胶”混合旋涂技术制作的片上射频Ni-Zn铁氧体磁膜微电感。成相良好的Ni0.3Zn0.6Cu0.1Fe2O4铁氧体纳米颗粒在光刻胶中均匀混合，再将该混合物涂覆在螺旋电感线圈上，实现电感性能的提升。这种新型低温工艺避免了常规制作铁氧体器件方法带来的高温处理（>600°C）对集成电路的破坏。与无磁膜覆盖样品对比，铁氧体覆盖电感的电感量在0.1-4GHz提升了14-27%。这是实现高性能、全兼容铁氧体集成片上RF IC电感的一种很有前景的途径。

关键词：铁氧体；电感；射频集成电路

Ni-Zn Ferrite-Powder-Mixed-Photoresist Coated on-Chip RF Inductor

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Abstract:

On-chip RF inductors with integrated Ni-Zn ferrite films using a novel nano-powder-mixed-photoresist coating technique is reported. Well synthesized nano-size Ni0.3Zn0.6Cu0.1Fe2O4 powders are mixed into photoresist and then coated on top of RF inductor spirals for performance improvement. This new low-temperature fabrication method is developed to eliminate any damage introduced by conventional high temperature process (>600° C) used in fabricating ferrite-integrated RF IC inductors. Measurement results show that, compared with air-cored inductor, the inductance (L) of ferrite film inductors increases by 14-27% across 0.1-4GHz range. This work demonstrates a promising way to fabricate ferrite-integrated high-performance on-chip RF inductors in IC technology.

Keywords: Ferrite; Inductor; RF IC

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